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## THE ECONOMIC ARGUMENT FOR CLEANING UP THE BAY AND ITS RIVERS

Congress has recognized that the Chesapeake Bay is a “national treasure and resource of worldwide significance.”<sup>1</sup> Respected economists have valued the Bay at over one trillion dollars related to fishing, tourism, property values, and shipping activities.<sup>2,3</sup> Hence, the protection and restoration of the Chesapeake is essential for a healthy and vibrant regional economy. Failure to “save the Bay” threatens this economic driver. In fact, economic losses have already occurred due to water-quality degradation throughout the watershed. Conversely, investing in clean-water technology creates jobs, generates economic activity, and saves money in the long run.

Efforts to delay implementation of the Bay Total Maximum Daily Load (TMDL) will only exacerbate the economic losses this region has already experienced due to poor water quality.

### **Investment in clean-water technologies creates jobs and stimulates local economies.**

A recent study by the University of Virginia found that implementation of agricultural practices such as livestock stream exclusion, buffers, and cover crops would generate significant economic impacts.<sup>4</sup> Every \$1 of state and/or federal funding invested in agricultural best management practices would generate \$1.56 in economic activity in Virginia. Implementing agricultural practices in Virginia to the levels necessary to restore the Bay would create nearly 12,000 jobs of approximately one year’s duration.

A recent analysis of the value of investing in water and sewer infrastructure concluded that these investments typically yield greater returns than most other types of public infrastructure.<sup>5</sup> For example, \$1 of water and sewer infrastructure investment increases private output (Gross Domestic Product) in the long-term by \$6.35. Furthermore, adding a job in water and sewer creates 3.68 jobs to support that one.

More specifically, upgrading sewage treatment plants across the watershed has created hundreds of construction jobs, and it will create perhaps thousands more as the program grows. Also, upgrading individual septic systems has employed installers, electricians, and others involved in the business. These upgrades have pumped millions of dollars into the region’s economy. A real-life example is Mayer Brothers, Inc., in Elkridge, Maryland.<sup>6</sup> This company staved off significant layoffs this year when it won a contract from the Maryland Department of the Environment (MDE) to help supply new septic technology throughout Maryland.

On the flip side, cuts to funding programs for clean-water infrastructure will lead to job losses. Carter B. McCamy says he will probably have to lay off over 20 workers from his Arbutus company if the Maryland legislature cuts the Chesapeake and Atlantic Coastal Bays 2010 Trust Fund.<sup>7</sup> The firm has received significant contracted work through the Trust Fund and employs 115 full-time workers and supports an additional 100 subcontractors who provide trucking materials, concrete, paving, and fencing required for stormwater mitigation projects.

## The Chesapeake Bay supports economically and ecologically important commercial and recreational fisheries.

The Chesapeake's fisheries industry, including both shellfish and finfish, is a significant part of the region's local economy. The 2008 Fisheries Economics of the U.S. report by the National Oceanic and Atmospheric Administration (NOAA) indicates that the commercial seafood industry in Maryland and Virginia contributed \$2 billion in sales, \$1 billion in income, and more than 41,000 jobs to the local economy.<sup>8</sup>

The economic benefits of saltwater recreational fishing are equally impressive, contributing \$1.6 billion in sales that in turn contributed more than \$800 million of additional economic activity and roughly 13,000 jobs.<sup>9</sup> The majority (90-98 percent) of the commercial and recreational saltwater landings in the Mid-Atlantic region come from the Chesapeake Bay.<sup>10</sup>

### Crabs

Arguably no other creature exemplifies the Chesapeake Bay better than the blue crab, *Callinectes sapidus*. For more than a half century, the blue crab has been at the apex of the Bay's commercial fisheries. Over one-third of the nation's blue crab harvest comes from the Bay. The average annual commercial harvest in Maryland and Virginia between 1999 and 2008 was about 55 million pounds.<sup>11</sup> The dockside value of the blue crab harvest Bay-wide in 2008 was approximately \$70 million.<sup>12</sup> The recreational crab fishery also provides a significant financial offset for Bay residents—the cost of catching crabs is far less than having to buy them.

### Oysters

Another critical Bay species, commercially, recreationally, and ecologically is the American oyster, *Crassostrea virginica*. From the late 1800s to the mid-1900s, the commercial oyster industry employed thousands of people catching, selling, shucking, and shipping oysters to market. Hundreds of skipjacks—sail-powered dredge boats—plied the waters of the Bay in search of the delectable oyster. The industry generated millions of dollars a year for the Bay economy. Until the mid-1980s, oysters supported the leading commercial fishery in the Bay. Like the blue crab, Chesapeake oysters spawned a rich cultural heritage.

In addition to their commercial and recreational value, oysters improve water quality because they are filter feeders. An individual oyster pumps over 50 gallons of water a day through its gills, which strain out food and pollutants: chemicals, nitrogen, phosphorus, and sediment. In addition, oyster reefs provide valuable habitat for countless Bay creatures—most notably finfish—and serve as popular fishing areas.

### Rockfish

Rockfish or striped bass, *Morone saxatilis*, has been and remains the most popular commercial and recreational finfish in the Bay, generating roughly \$500 million of economic activity related to fishing expenditures, travel, lodging, etc.<sup>13</sup>

## Each of these critical fisheries has been degraded by poor water quality with significant resulting economic losses.

The economic losses associated with the decline in fisheries resources in the Bay are substantial. Between 1994 and 2004, the value of Virginia's seafood harvest decreased by 30 percent<sup>14</sup> with Maryland's commercial landings exhibiting a similar decline during that time.<sup>15</sup> Jobs declined as well. In 1974 there were 136 oyster shucking houses, today only about half a dozen remain.<sup>16</sup>

## Crabs

The overall crab trend since the 1990s has been a decrease in landings despite increased crabbing effort.<sup>17</sup>

In addition, the number of crabs one year and older dropped from 276 million in 1990 to 131 million in 2008.<sup>18</sup> When the broader impact on restaurants, crab processors, wholesalers, grocers, and watermen is added up, the decline of crabs in the Bay has meant a cumulative loss to Maryland and Virginia of about \$640 million between 1998 and 2006.<sup>19</sup>

As a result of the low population level, in 2008, Maryland and Virginia issued severe crabbing restrictions, in an attempt to restore the population. These restrictions placed severe economic hardship on Chesapeake Bay crabbers. In response, members of Congress from Maryland and Virginia requested federal disaster relief for Bay crab fishermen. In September 2008, the Secretary of Commerce determined that the Chesapeake Bay soft shell blue crab fishery had undergone a commercial failure as defined under the Magnuson-Stevens Fishery Conservation and Management Act (16 USC § 1861). In January 2009, the Department of Commerce allocated \$10 million of disaster relief to each state.<sup>20</sup>

In 2009, the number of spawning-age crabs rebounded to 223 million.<sup>21</sup> Nonetheless, poor water quality continues to limit crab populations in the Chesapeake Bay. On average, over the last 10 years, more than 75 percent of the Chesapeake Bay and its tidal rivers have had insufficient levels of dissolved oxygen.<sup>22</sup> Low oxygen levels drive blue crabs from their preferred habitat and kill many of the small bottom organisms on which they feed.<sup>23</sup> The low dissolved oxygen conditions caused by nitrogen and phosphorus pollution are the primary reason large sections of the Bay have become unsuitable as blue crab habitat. In addition, a study by the University of Maryland demonstrated that decreases in dissolved oxygen can reduce crab harvests and revenue to watermen.<sup>24</sup>

Poor water clarity also has impacted crab populations. This pollution-driven problem has reduced the acreage of underwater grasses necessary to protect juvenile crabs, molting crabs, and adult crabs from predation. Studies have shown that crabs living in areas with little or no coverage of underwater grasses suffer higher mortality.<sup>25</sup> Water clarity in the Bay has been decreasing since the 1990s and in 2009, only 26 percent of it had acceptable water clarity.

The conclusion is clear: Until water quality improves, the blue crab population will not fully recover.<sup>26</sup>

## Oysters

A combination of overharvesting, disease, and pollution has decimated the oyster populations in the Chesapeake Bay. Silt washed by rain from urban areas and agricultural fields can bury oyster beds, particularly those that have been flattened by dredges.<sup>27</sup> Extended periods of zero-oxygen conditions can be fatal to oysters.<sup>28</sup> In addition, recent studies have indicated that low oxygen levels can stress the oysters' immune systems, making them more susceptible to disease.<sup>29</sup> Pollution has also resulted in the closure of shellfish beds to commercial harvesting. Threats from sewage and bacteria forced Maryland and Virginia to close or restrict oyster harvesting in 223, 864 acres of the Bay and its tributaries in 2008, about eight percent of the total shellfish beds.<sup>30</sup> The decline of the Bay oyster over the last 30 years has meant a loss of more than \$4 billion for Maryland and Virginia.<sup>31</sup>

## Rockfish

Faced with a catastrophic collapse in the fishery, Maryland banned commercial and recreational fishing in its portion of the Bay from 1985-89, and Virginia followed suit with a one-year moratorium in 1989.<sup>32</sup> The dramatic decline of the population was due to several factors, including heavy overfishing and low dissolved oxygen in many parts of the Bay. Today, the rockfish population is at its highest in decades because of tight catch restrictions. However, scientists are concerned about high prevalence of the usually-fatal wasting disease *Mycobacteriosis*. The fishes'

current susceptibility to it appears to come from environmental stress generated by poor water quality and limited availability of preferred prey.<sup>33</sup>

A 2001 study compared the 1996 water quality of the Bay with what it would have been without the Clean Water Act. Results indicated that benefits of water-quality improvements to annual recreational boating, fishing, and swimming ranged from \$357.9 million to \$1.8 billion.<sup>34</sup> Fisheries declines since the 1990s indicate that early progress reducing pollution hasn't been sustained. We must reverse this trend.

## **These economic losses are not restricted to the tidal regions of the Bay watershed.**

According to the Pennsylvania Fish and Boat Commission (PFBC), nearly two million people go fishing in Pennsylvania each year, contributing over \$1.6 billion to the economy. Among the most popular fish for anglers are warmwater species, especially smallmouth bass, and coldwater species, especially native brook trout. The PFBC recently passed a proposal to be enacted January 1, 2011, that mandates total catch-and-release of smallmouth bass in certain areas of the Susquehanna River because of population declines associated with water-quality problems. Degraded stream habitat has restricted the Pennsylvania brook trout to a small fraction of its historical distribution.

Virginia, and to a lesser extent Maryland, also support significant freshwater recreational fisheries, with roughly one million anglers participating and contributing millions to local economies.<sup>35</sup> By way of example, a fish kill in the Shenandoah River watershed in 2005—likely caused in part by poor water quality—resulted in roughly a \$700,000 loss in retail sales and revenues.<sup>36</sup>

If pollution to the Bay is left unabated, we will see continued decline of the region's fisheries and the resulting economic impacts.

## **Polluted waters also hurt public health and local economies.**

Unhealthy waters increase public health burdens associated with consuming tainted fish or shellfish and exposure to waterborne infectious disease while recreating. For example, one study estimated the cost associated with exposure to polluted recreational marine waters to be \$37 per gastrointestinal illness, \$38 per ear ailment, and \$27 per eye ailment due to lost wages and medical care.<sup>37</sup>

Furthermore, although closing a beach is meant to prevent illness, it directly and indirectly results in an economic loss for local businesses and the county where the beach is located. For example, a study by NOAA indicated that a one-day beach closure in Huntington Beach, California, was expected to result in thousands of dollars of lost income for local communities.<sup>38</sup> There are hundreds of beach closures in the Bay region each year;<sup>39</sup> potentially resulting in hundreds of thousands of dollars of lost income for local economies.

## **Nature-based recreation such as wildlife watching, ecotourism, and boating that are dependent on clean water are vital economic drivers for the Bay region.**

Roughly eight million wildlife watchers spent \$636 million, \$960 million, and \$1.4 billion in Maryland, Virginia,

and Pennsylvania, respectively, in 2006 on trip-related expenses and equipment.<sup>40</sup> These estimates do not include other economic benefits of these expenditures, such as job creation and the multiplier effect on local economies. Improvements to water quality through land preservation, reforestation, and wetlands restoration will increase and enhance wildlife populations. A study in the Great Lakes indicates there would be substantial improvement in wildlife-watching opportunities and associated economic benefits by improvements to wildlife habitat.<sup>41</sup>

Recreational boating is also a strong economic driver in Maryland, Pennsylvania, and Virginia. The total impact on the Maryland economy from recreational boating is estimated to be about \$2.03 billion and 35,025 jobs.<sup>42</sup> Similarly, Pennsylvania residents spend \$1.7 billion on boating annually. The average expenditure per recreational boater each year is \$274. Of this amount, roughly \$113 is spent in direct boating-related expenses and \$161 is spent on trip-related expenses, including: auto fuel, meals, lodging, and admission/entrance fees.<sup>43</sup>

A recent study in Hampton, Virginia, found that resident and non-resident boaters were responsible for \$55 million in economic impact to that city. This impact represents \$32.5 million in new value added, \$22.5 million in incomes, and 698 jobs.<sup>44</sup> The majority of expenditures were spent by out-of-region boating visitors, so they represent an inflow of “new” capital to the community. The study also indicated that “water quality, fishing quality, and other environmental factors” ranked among the most important influences on a boater’s decision of where to keep his or her boat.

## **Clean waterways increase property values.**

A U.S. Environmental Protection Agency (EPA) study indicated that clean water can increase the value of single family homes up to 4,000 feet from the water’s edge by up to 25 percent.<sup>45</sup> A 2000 study concluded that improvements in water quality along Maryland’s western shore to levels that meet state bacteria standards could raise property values six percent.<sup>46</sup> High water clarity was shown to increase average housing value by four to five percent or thousands of dollars.<sup>47,48</sup> Homes situated near seven California stream restoration projects had three to 13 percent higher property values than similar homes located on damaged streams.<sup>49</sup> A study by the Brookings Institute projected a 10 percent increase in property values for homes that would abut a proposed \$26 billion Great Lakes restoration project.<sup>50</sup> The City of Philadelphia estimates that installation of green stormwater infrastructure in the city will raise property values two to five percent, generating \$390 million over the next 40 years in increased values for homes near green spaces.<sup>51</sup>

## **Pollution reductions lower drinking water and other utility costs.**

Reducing pollution inputs from pipes and land-based sources can reduce locality costs to treat drinking water sources to safe standards. New York City’s expenditure of \$1 billion over the last decade to protect the watersheds north of the city that supply its drinking water avoided the need to build a \$6 billion treatment plant.<sup>52</sup> An EPA study of drinking water source protection efforts concluded that every \$1 spent on source-water protection saved an average of \$27 in water treatment costs.<sup>53</sup> Similarly, a study by the Brookings Institute suggested that a one percent decrease in sediment loading will lead to a 0.05 percent reduction in water-treatment costs.<sup>54</sup>

Proactive efforts to lessen stormwater flows today reduce future public costs needed to maintain navigation channels, remediate pollution and hazard flooding, and repair infrastructure and property damage caused by excessive

runoff. Philadelphia estimates that after 40 years, their installation of green infrastructure will create more than \$2 in benefits for every dollar invested, generating \$500 million in economic benefits, \$1.3 billion in social benefits, and \$400 million in environmental benefits.<sup>55</sup>

## Conclusion

Efforts to delay implementation of the Bay Total Maximum Daily Load (TMDL) will only exacerbate the economic impacts this region has already experienced due to poor water quality. Furthermore, a recent poll in Virginia found that an overwhelming majority believe the state can protect water quality and still have a strong economy. Eighty percent of respondents agreed with the statement, “we can protect the water quality in rivers, creeks, and the Chesapeake Bay and have a strong economy with good jobs for Virginians, without having to choose one over the other.” Of those polled, 92 percent believe the Bay is “important for Virginia’s economy.” Implementation of the TMDL will result in clean water, a healthy Bay, and a strong regional economy.

## End Notes

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- <sup>15</sup> Same as #8.
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- <sup>17</sup> Tom Horton. 2003. *Turning the Tide: Saving the Chesapeake Bay*. Second Edition. Island Press. Washington, D.C. 2003.
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- <sup>19</sup> Unpublished data. Dr. James Kirkley, Virginia Institute of Marine Science.
- <sup>20</sup> [http://www.nefsc.noaa.gov/press\\_release/2009/MediaAdv/MA0906/](http://www.nefsc.noaa.gov/press_release/2009/MediaAdv/MA0906/)
- <sup>21</sup> Same as #18.

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